

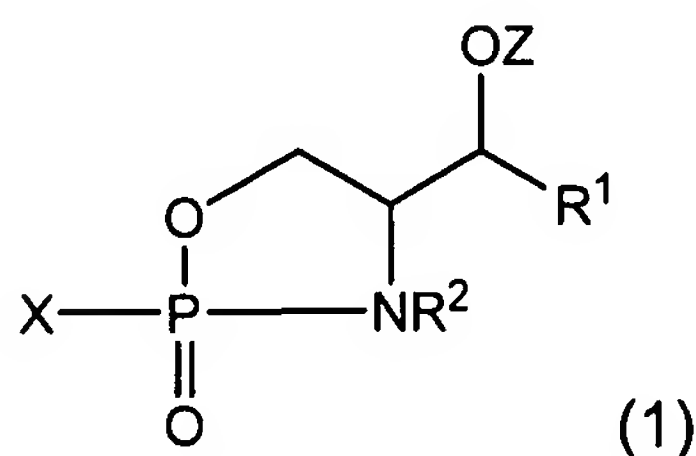
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. – 56. (Canceled)

57. (Currently Amended) An oxazaphospholane compound of formula (1):



wherein

R¹ represents a C₁-C₂₄ aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally comprising ~~containing~~ an aliphatic ring,

R² represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C₁-C₂₄ aliphatic moiety which is a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally comprising an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents comprising a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur,

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), t-butyltrimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), t-butyl carbamate (t-boc), and $\text{Si}(\text{R}^5)_3$, R^5 being the same or different within the $\text{Si}(\text{R}_5)_3$, the protecting group being a $\text{C}_1\text{-C}_6$ branched or straight alkyl group, or an aryl group, and

X represents a leaving group chemical moiety that is replaced under nucleophilic attack in the presence of a nucleophilic reagent.

58. (Cancelled)

59. (Previously presented) The oxazaphospholane compound of claim 57, wherein R^1 represents a $\text{C}_8\text{-C}_{24}$ aliphatic moiety.

60. (Currently Amended) The oxazaphospholane compound of claim 57 ~~58~~, wherein R^2 represents a hydrogen atom or a saturated or unsaturated $\text{C}_8\text{-C}_{24}$ aliphatic moiety.

61. (Previously presented) The oxazaphospholane compound of claim 60, wherein R^2 represents a hydrogen atom.

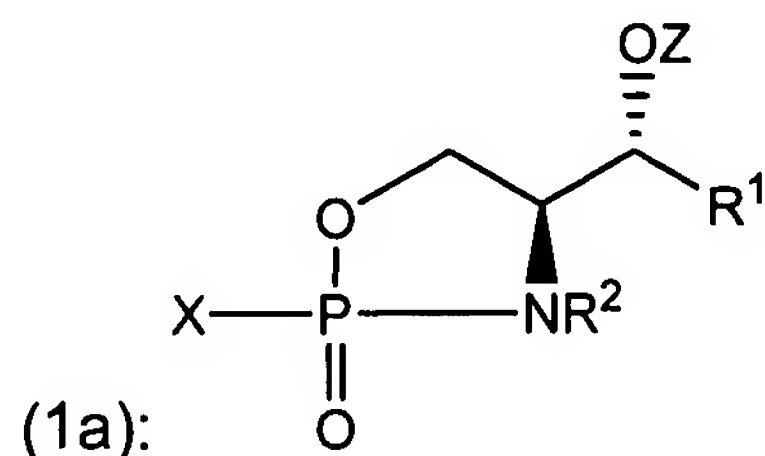
62. (Previously presented) The oxazaphospholane compound of claim 57, wherein X represents a halogen atom.

63. (Previously presented) The oxazaphospholane compound of claim 62, wherein X represents Cl.

64. (Previously Presented) The oxazaphospholane compound of claim 57, wherein Z represents a $\text{Si}(\text{R}^5)_3$ group in which R^5 may be the same or different in the same compound and represents a $\text{C}_1\text{-C}_6$ branched or straight alkyl group or an aryl group.

65. (Currently amended) The oxazaphospholane compound of claim 57 64, wherein Z represents $\text{Si}(\text{Ph})_2(\text{t-Bu})$.

66. (Currently Amended) An oxazaphospholane compound of formula

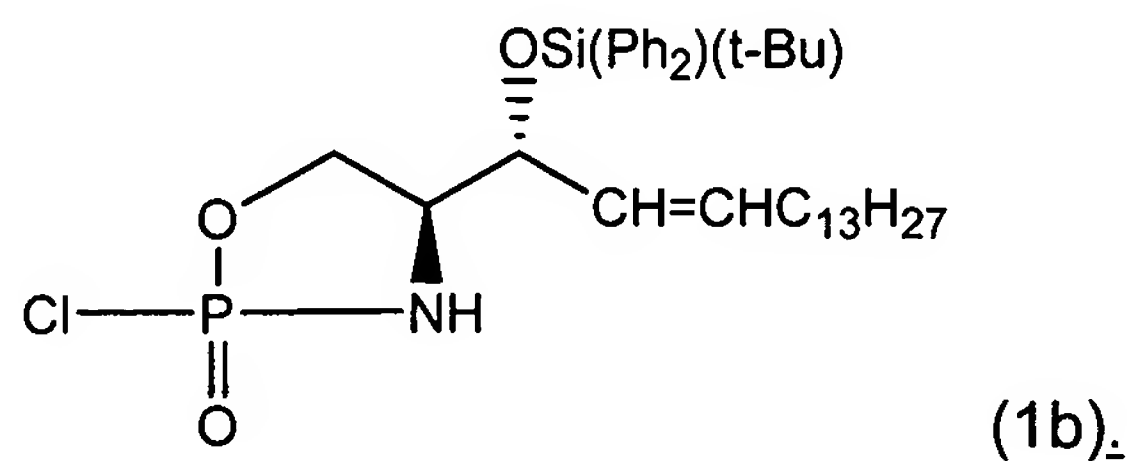


(1a) being the 2S,3R stereoisomer of the compound of claim 57, wherein R^1 , R^2 , X and Z are as defined in the said Claim 57.

67. (Previously presented) The oxazaphospholane compound of claim 57, wherein R^1 is (E)- $\text{CH=CHC}_{13}\text{H}_{27}$, R^2 is hydrogen, X is Cl and Z is $\text{Si}(\text{Ph})_2(\text{t-Bu})$.

68. (Previously Presented) The oxazaphospholane compound of claim 57, wherein R¹ is (*E*)-CH=CHC₁₃H₂₇, R² is hydrogen, and X is substituted with the group –O-CH₂-CH₂-N⁺(CH₃)₃.

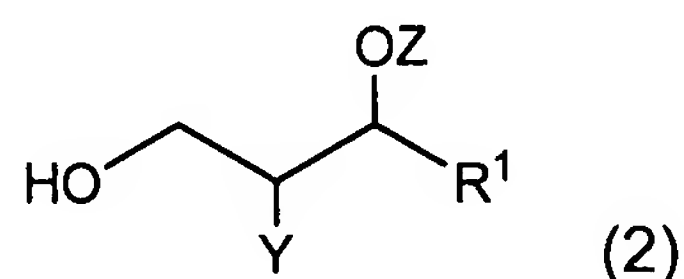
69. (Currently Amended) The oxazaphospholane compound of claim 57, being the (*E*)-geometrical isomer of the compound of formula (1b):



70. (Previously presented) The oxazaphospholane compound of claim 57, being an isolated stable compound.

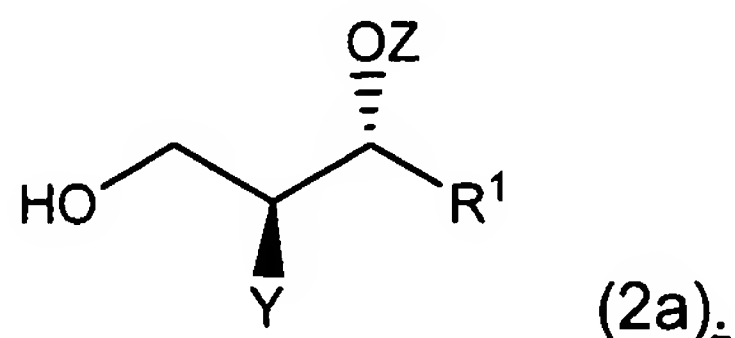
71. (Currently Amended) A process for the manufacture of an oxazaphospholane compound of formula (1) as defined in claim 57, the process comprising ~~comprises~~

reacting a phosphorylating reagent selected from the group consisting of POW_3 , where W represents a halogen atom, an ethylene chlorophosphite, a methyl phosphodichloridite, a chloro-N,N-diisopropylaminomethyloxophosphite and $[(\text{isopropyl})_2\text{N}]_2\text{POCH}_2\text{CH}_2\text{CN}$ with a 3-O-protected sphingoid compound of formula (2):



wherein R^1 , Z and X are as defined in claim 57, and Y is an amine or an amino group.

72. (Currently Amended) The process of claim 71, further comprising reacting the phosphorylating reagent with a 2S, 3R stereoisomer of formula (2a):

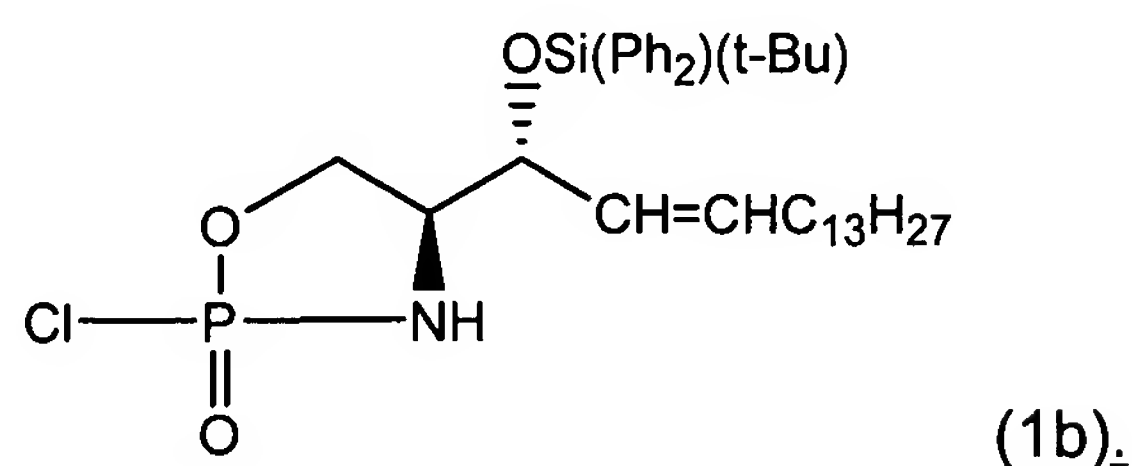


73. (Currently Amended) The process of claim 71, wherein the ~~said~~ phosphorylating reagent is reacted with the protected sphingoid compound in which Y represents NH_2 .

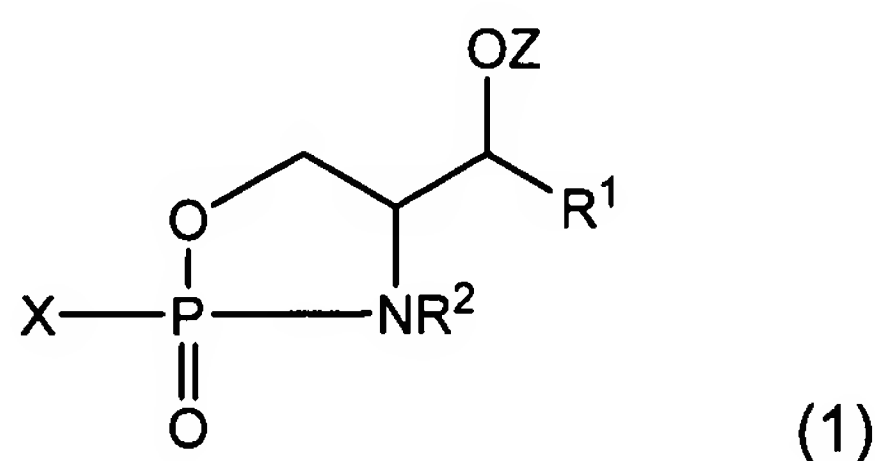
74. (Cancelled)

75. (Currently Amended) The process of claim 71 ~~74~~, wherein the said phosphorylating reagent is POCl₃.

76. (Currently Amended) The process of claim 71, for the synthesis of the (*E*)-geometrical isomer of the compound of formula (1b):



77. (Currently Amended) An oxazaphospholane compound of formula (1):



wherein

R¹ represents a C₁-C₂₄ aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally comprising ~~containing~~ an aliphatic ring,

R² represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C₁-C₂₄ aliphatic moiety which is a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally comprising an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents comprising a

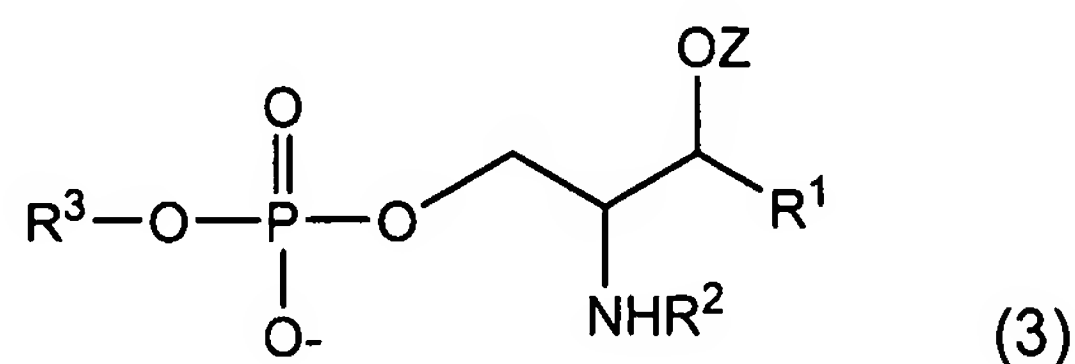
heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur,

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (t-boc), and Si(R₅)₃, R₅ being the same or different within the Si(R₅)₃ and a C1-C6 branched or straight alkyl group, or an aryl group, and

X represents a leaving group chemical moiety that is replaced under nucleophilic attack in the presence of a nucleophilic reagent, obtainable by the process of claim 71.

78. (Cancelled)

79. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, for the manufacture of an acyclic oxazaphospholane derivative having the following formula (3):



wherein R¹, R² and Z are as defined, and R³ represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated ring or an aryl group, said aliphatic chain may be branched or straight, saturated or unsaturated chain; or ether, polyether, or sugar moiety;

the process comprises the step of reacting said oxazaphospholane of formula (1) with an alcohol or the formula R^3OH where R^3 is as defined, followed by treatment with an aqueous base or aqueous acid.

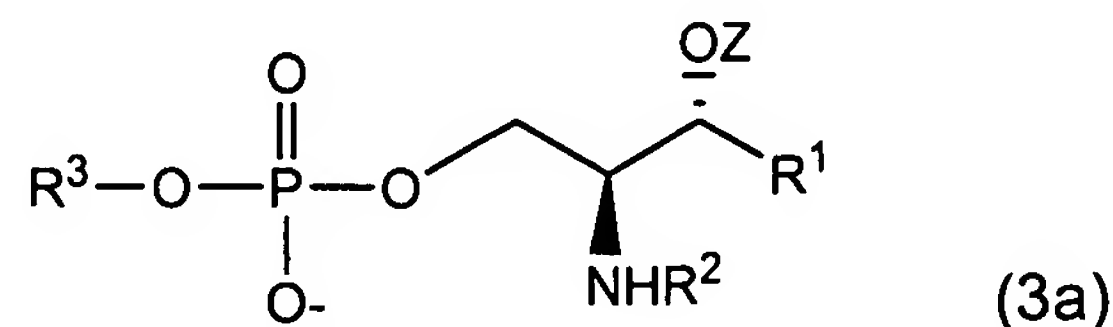
80. (Withdrawn) The process of claim 79, wherein said alcohol is selected from choline, N-protected ethanolamines, oligoethyleneglycol monoethers, polyethyleneglycol monoethers, polyethers, or sugar moiety.

81. (Withdrawn) The process of claim 80, wherein said alcohol is choline.

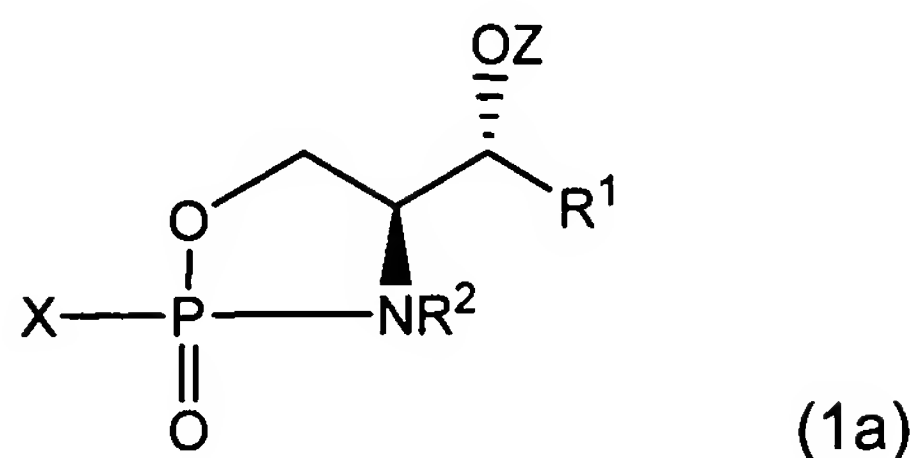
82. (Withdrawn) The process of claim 79, wherein said aqueous base is selected from trialkylamine, alkali metal- or alkali earth metal- hydroxide, carbonate or bicarbonate.

83. (Withdrawn) The process of claim 79, wherein said aqueous acid is a strong mineral acid or a Lewis acid.

84. (Withdrawn) The process of claim 79 for the manufacture of the 2S, 3R stereoisomer of formula (3a):



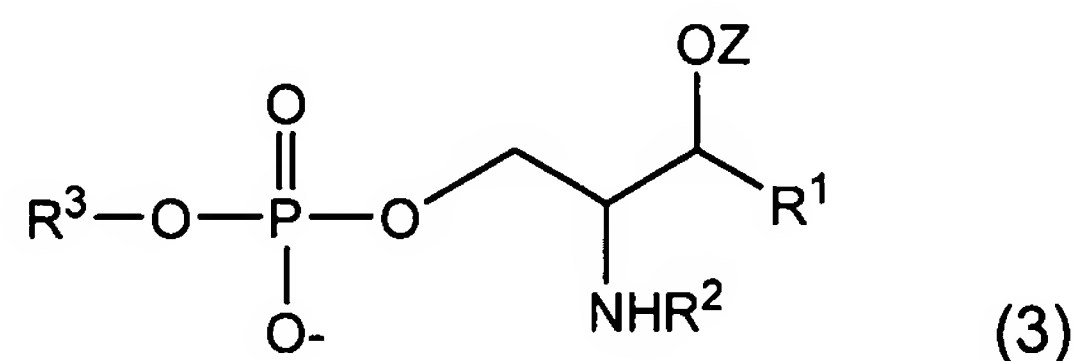
the process making use of a compound of formula (1a)



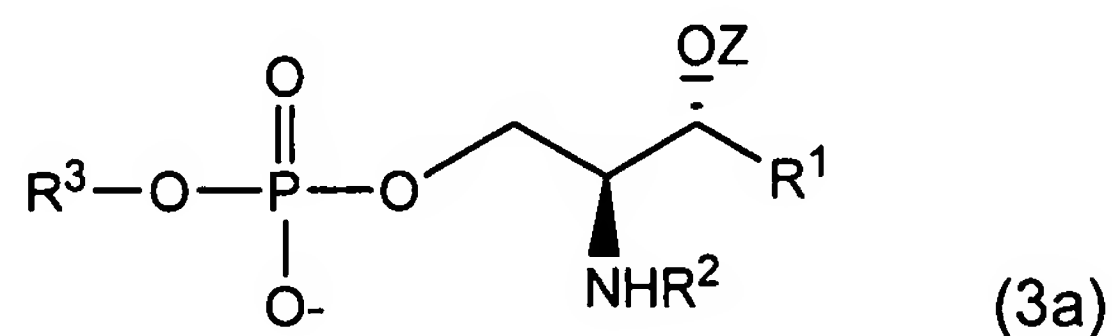
wherein R^1 , R^2 , R^3 , X and Z are as defined in claim 79.

85. (Withdrawn) The process of claim 79, comprising reacting said compound of formula (3) or (3a) with a protecting group removing reagent to replace the protecting group Z with a hydrogen atom.

86. (Withdrawn) A phosphate derivative having the following formula (3):

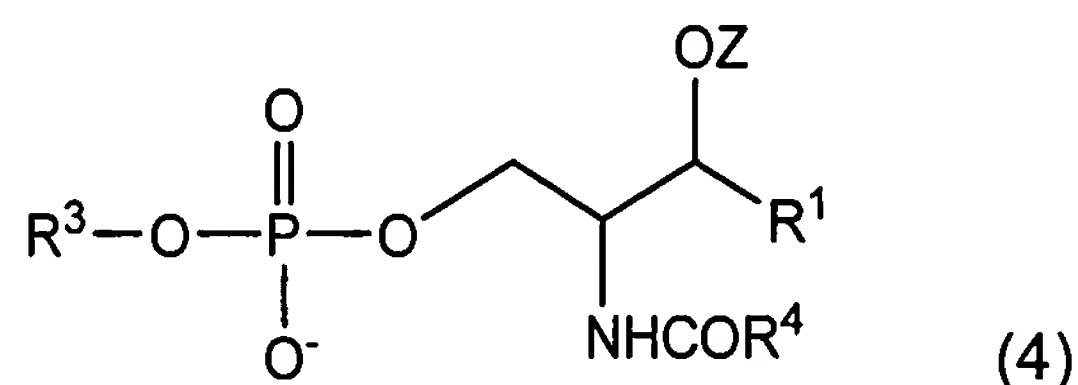


or its 2S, 3R stereoisomer of formula (3a):



obtained by the process of claim 79, wherein R^1 , R^2 , R^3 and Z are as defined in said claim 79.

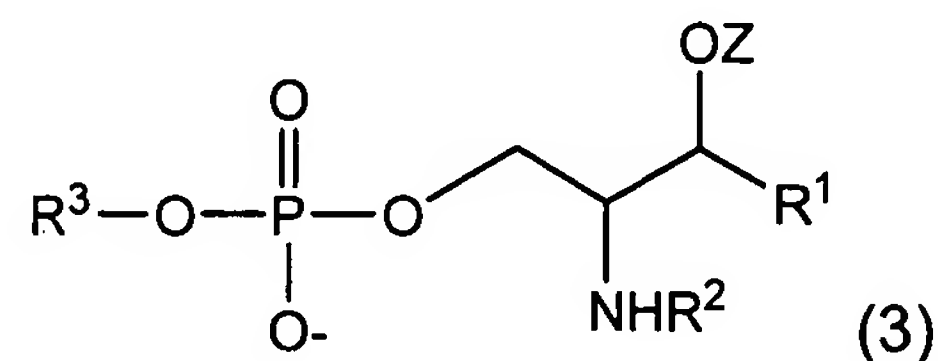
87. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, wherein R^2 is a hydrogen atom, for the manufacture of a phosphate derivative having the following formula (4):



wherein R^1 , and Z are as defined, R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated or aromatic ring, said aliphatic chain may be branched or straight, saturated or unsaturated chain; or an ether, polyether, or sugar moiety; and R^4 is a hydrophobic group;

the process comprises

preparing a phosphate derivative of formula (3),



wherein R^1 , R^2 and Z are as defined, and R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated ring or an aryl group, said aliphatic chain may be branched or straight, a saturated or unsaturated chain; or ether, polyether, or a sugar moiety; and

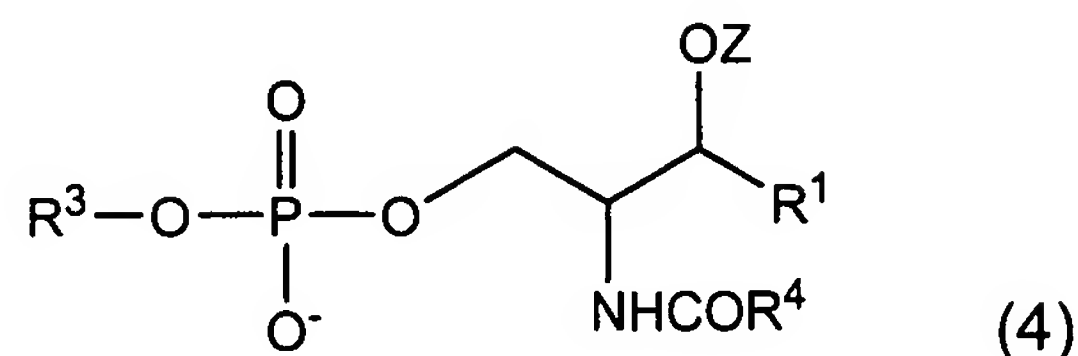
reacting said phosphate derivative of formula (3) with an acyl compound of formula $R^4C(O)Q$, wherein Q is a leaving group.

88. (Withdrawn) The process of claim 87, wherein said R^4 represents a C_1 - C_{24} aliphatic moiety selected from saturated or unsaturated, branched or linear aliphatic chain, said aliphatic chain optionally containing an aliphatic ring; the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from oxygen, halogen, nitrogen and sulfur.

89. (Withdrawn) The process of claim 88, wherein said R^4 represents a saturated or unsaturated C_8 - C_{24} aliphatic chain.

90. (Withdrawn) The process of claim 87, for the manufacture of the 2S, 3R stereoisomer of the compound of formula (4), said process making use of the 2S, 3R stereoisomer of the compound of formula (1a).

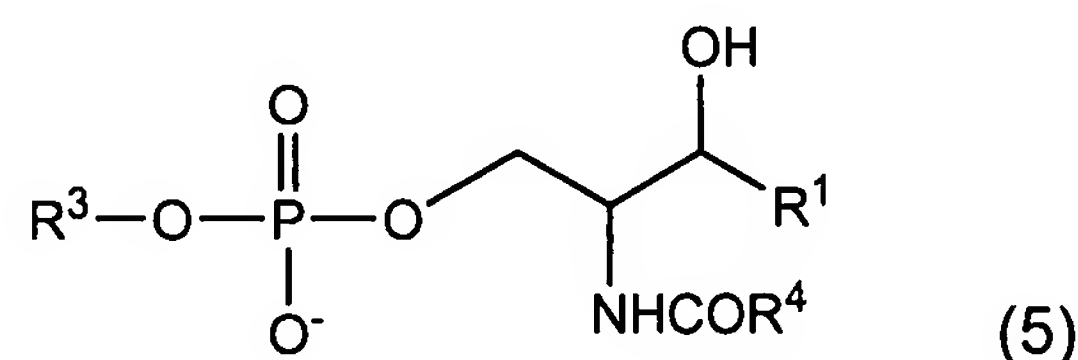
91. (Withdrawn) A phosphate derivative having the following formula (4):



or its 2S, 3R stereoisomer;

obtained by the process of claim 86, wherein R¹, R³, R⁴ and Z are as defined.

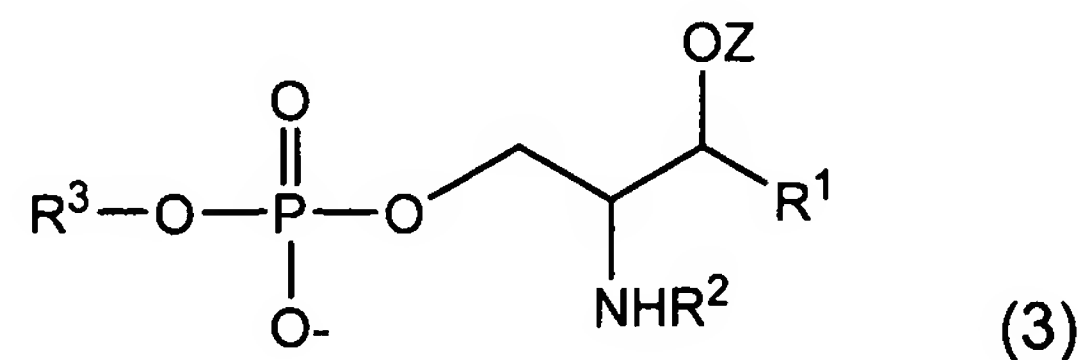
92. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, wherein R² is a hydrogen atom, for the manufacture of a sphingomyelin derivative having the following formula (5):



where R¹ and R³ are as defined, and R⁴ is a hydrophobic group,

the process comprises:

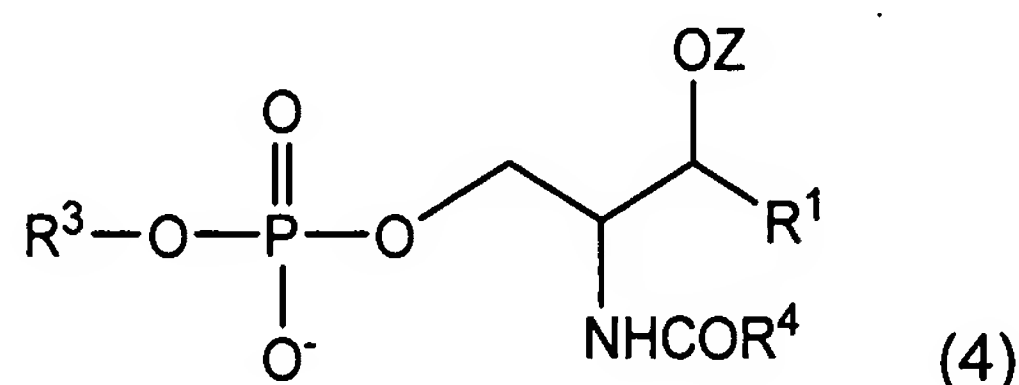
reacting said oxazaphospholane of formula (1) with an alcohol or the formula R³OH where R³ is as defined, followed by treatment with an aqueous base or aqueous acid to obtain a phosphate derivative having the following formula (3):



wherein R¹, R² and Z are as defined, and R³ represent a hydrogen atom; an

aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated ring or an aryl group, said aliphatic chain may be branched or straight, a saturated or unsaturated chain; or ether, polyether, or a sugar moiety;

reacting said phosphate derivative of formula (3) with an acyl compound of formula $R^4C(O)Q$, wherein Q is a leaving group and R^4 represents a C_1 - C_{24} aliphatic moiety selected from saturated or unsaturated, branched or linear aliphatic chain, said aliphatic chain optionally containing an aliphatic ring; the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from oxygen, halogen, nitrogen and sulfur, to obtain a phosphate derivative of the following formula (4):



wherein R^1 , and Z are as defined, R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated or aromatic ring, said aliphatic chain may be branched or straight, saturated or unsaturated chain; or an ether, polyether, or sugar moiety; and R^4 is a hydrophobic group; and

reacting said phosphate derivative of formula (4) with a protecting group removing agent to obtain a said sphingomyelin.

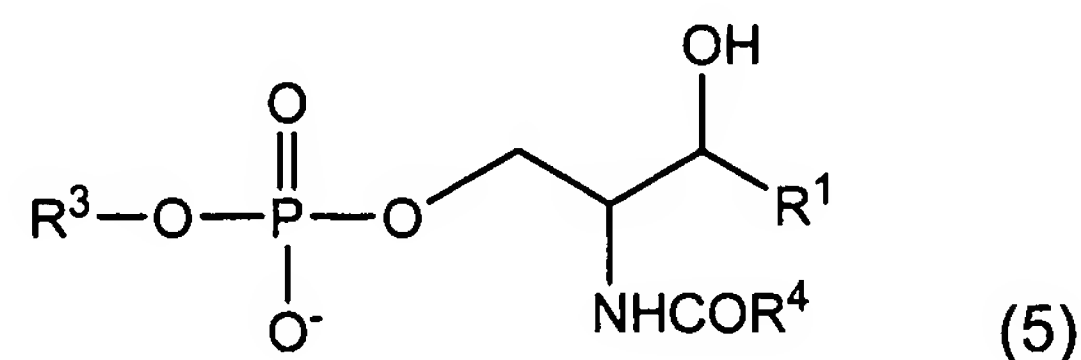
93. (Withdrawn) The process of claim 92, for the manufacture of the 2S, 3R stereoisomer of the compound of formula (5), said process making use of the 2S, 3R stereoisomer of the compound of formula (1a).

94. (Withdrawn) The process of claim 92, wherein Z in said compound of formula (4) is Si(Ph₂)(t-Bu).

95. (Withdrawn) The process of claim 92, wherein said protecting group is removed by the use of hydrogen fluoride or (R⁶)₄NF, wherein R⁶ is a C₁-C₆ alkyl group.

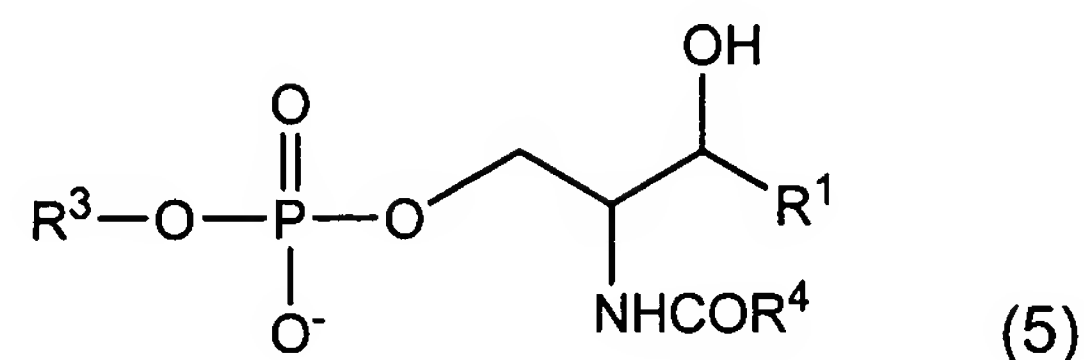
96. (Withdrawn) The process of claim 95, wherein R⁶ is n-butyl.

97. (Withdrawn) A sphingomyelin having the following formula (5):



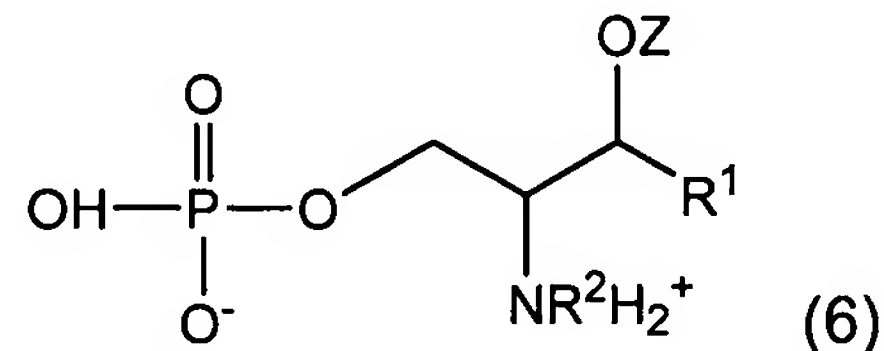
or its 2S, 3R stereoisomer obtainable by the process of claim 92, wherein said R¹, R³ and R⁴ are as defined, provided that when said R² represents a C₁₅ or C₁₇ alkyl chain, R¹ cannot represent trans-CH=CHC₁₃H₂₇ and R³ cannot represent CH₂CH₂N⁺(CH₃)₃.

98. (Withdrawn) A sphingomyelin having the following formula (5):



or its 2S, 3R stereoisomer, obtained by the process of claim 92, wherein said R^1 , R^3 and R^4 are as defined in said claim 92.

99. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, for the manufacture of a phosphate derivative having the following formula (6):



wherein R^1 , R^2 and Z are as defined, the process comprises reacting said oxazaphospholane of formula (1) with an aqueous base or an aqueous acid.

100. (Withdrawn) The process of claim 99, for the manufacture of the 2S, 3R stereoisomer of the compound of formula (6), said process making use of the 2S, 3R stereoisomer of the compound of formula (1a).

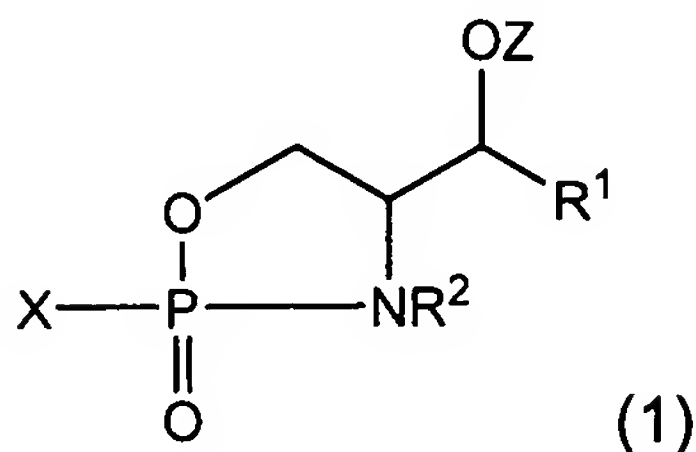
101. (Withdrawn) The process of claim 99, wherein said aqueous base is selected from trialkylamine, alkali metal- and alkali earth metal- hydroxide, carbonate or bicarbonate

102. (Withdrawn) The process of claim 99, wherein said aqueous acid is a strong mineral acid or a Lewis acid.

103. (Withdrawn) A phosphate derivative having the formula (6), or (6a) obtained by the process of claim 92.

104. (Withdrawn) A pharmaceutical composition comprising a sphingomyelin according to claim 97.

105. (Previously Presented) An oxazaphospholane compound of formula (1):



wherein

R^1 represents a C_1 - C_{24} aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

R^2 represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C_1 - C_{24} aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

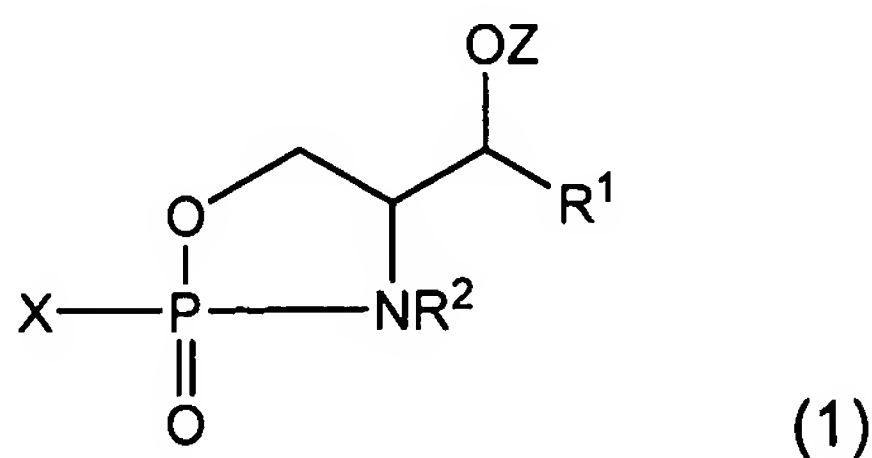
Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (t-boc), and $Si(R^5)_3$, wherein R^5 may be the same or different in the same moiety and is selected from a C_1 - C_6 branched or straight alkyl group or an optionally substituted aryl group; and

X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethyloxophosphite, and $[(isopropyl)_2N]_2POCH_2CH_2CN$, wherein X is

optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.

106. (Cancelled)

107. (Previously Presented) An oxazaphospholane compound of formula (1):



obtainable by the process of claim 71, wherein

R^1 represents a C_1 - C_{24} aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

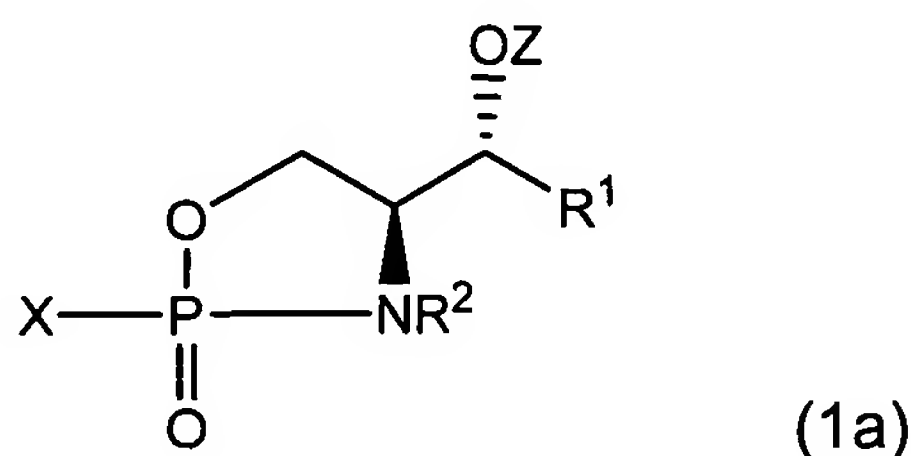
R^2 represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C_1 - C_{24} aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (t-boc), and $\text{Si}(\text{R}^5)_3$, wherein R^5 may be the same or different in the same moiety and is selected from a C_1 - C_6 branched or straight alkyl group or an optionally substituted aryl group; and

X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethyloxophosphite, and $[(\text{isopropyl})_2\text{N}]_2\text{POCH}_2\text{CH}_2\text{CN}$, wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.

108. (Previously Presented) The oxazaphospholane compound according to claim 107, wherein R^1 represents a C_8 - C_{24} aliphatic moiety; or Z represents a $Si(R^5)_3$ group in which R^5 may be the same or different in the same compound and represents a C_1 - C_6 branched or straight alkyl group or an aryl group.

109. (Previously Presented) An oxazaphospholane compound of formula (1a):



obtainable by the process of claim 71, wherein

R^1 represents a C_1 - C_{24} aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

R^2 represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C_1 - C_{24} aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (*t*-boc), and $Si(R^5)_3$, wherein R^5 may be the same or different in the same

moiety and is selected from a C₁-C₆ branched or straight alkyl group or an optionally substituted aryl group; and

X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethoxophosphite, and [(isopropyl)₂N]₂POCH₂CH₂CN, wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.

110. (Previously presented) The oxazaphospholane compound according to claim 109, wherein

R¹ represents a C₈-C₂₄ aliphatic moiety, or

Z represents a Si(R⁵)₃ group in which R⁵ may be the same or different in the same compound and represents a C₁-C₆ branched or straight alkyl group or an aryl group.

111. (New) The oxazaphospholane compound according to claim 57, wherein X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethoxophosphite, and $[(\text{isopropyl})_2\text{N}]_2\text{POCH}_2\text{CH}_2\text{CN}$,

wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether and a sugar moiety,

wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.